

Small Diameter Well Workgroup Update

SAM January Update 2003

Timothy W. Shields



Technical Workgroup Members

- Carol Spangenberg
Co-chairperson
County of San Diego SAM
- Kevin Heaton
Steering Committee Contact
County of San Diego SAM
- Blayne Hartman, HP Labs
- Barry Pulver, Regional Water
Quality Control Board.
- Timothy Shields
Co-chairperson
Anteon Corp.
- Jerry Shiller, geologist.
- Chuck Houser, Southern
California Soils and Testing
- Bill Hagen, Navy Public
Works Center

Other Interested Parties:

- *Wes McCall, Geoprobe Systems*
- *Jerry Boehm, Fugro*
- *Kent Cordry, GeoInsight*
- *Mark Kram, NFESC*

For More Information, Please Contact:

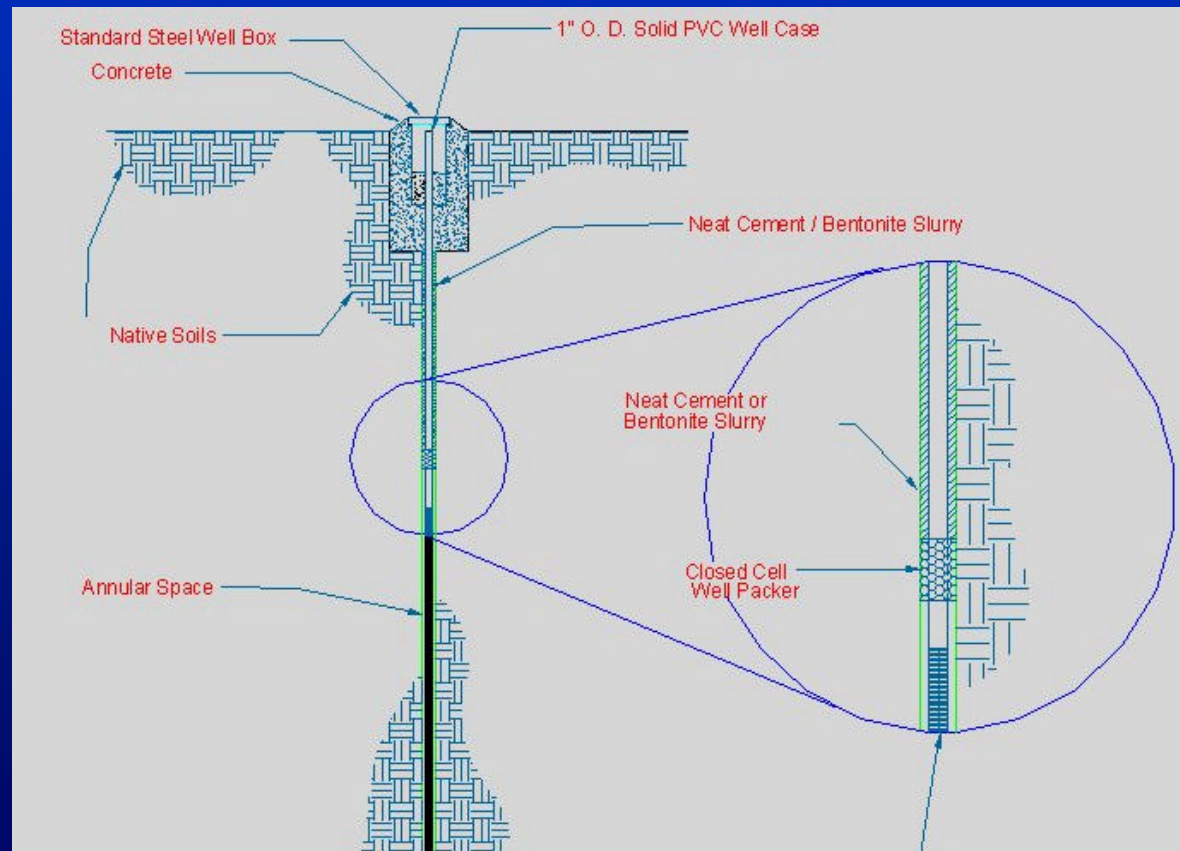
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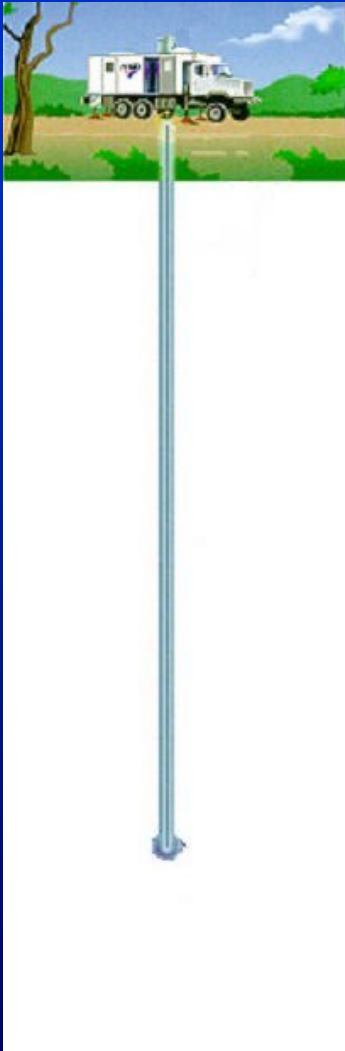
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What is a Small Diameter Well?

- A well with an annular space of less than 2 inches.
- Typical casing diameter less than 4 inches (often 1-inch diameter).

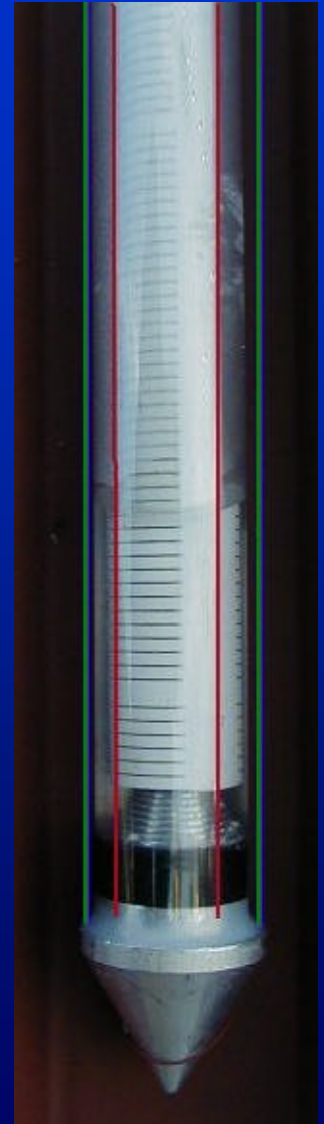


Small Diameter Wells Are Usually Constructed Using Direct Push Technology



Why is there a Technical Workgroup?

- In California, wells must be constructed in accordance with the California Well Standards (Bulletin 74) published by the California Department of Water Resources.
- The standards state that wells must have an annular space greater than 2 inches.



Why use Small Diameter Wells?

Cost Avoidance

- Less expensive equipment
- Faster production rates



Waste Reduction

- Can minimize or eliminate soil cuttings
- Can reduce development and purge water



Limited access

- Can install wells in areas that are inaccessible to hollow-stem auger rigs.



Contaminant Data From Small Diameter Wells is Usable



NAVAL FACILITIES ENGINEERING COMMAND
Washington, DC 20374-5065

NFESC Technical Report TR-2120-ENV

PERFORMANCE COMPARISON: DIRECT-PUSH WELLS VERSUS DRILLED WELLS

by

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January 2001

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MONITORING WELL COMPARISON STUDY:

AN EVALUATION OF DIRECT-PUSH

Versus

CONVENTIONAL MONITORING WELLS

May 1, 2002

A Study Conducted By

BP Corporation North America Inc.,

And

The Underground Storage Tank (UST) Programs of
U.S. Environmental Protection Agency
Regions 4, Atlanta GA
And
Region 5, Chicago, IL

Other Guidelines For “Direct Push Wells”

- ASTM D 6724-01 Standard Guide for Installation of Direct Push Ground Water Monitoring Wells
- ASTM D 6725-01 Standard Guide for Direct Push Installation of Prepacked Screen Monitoring Wells in Unconsolidated Aquifers
- Oregon Administrative Rules 690-240-0139 Direct Push Monitoring Wells and Piezometers
- South Carolina Well Standards R.61-71
- Indiana Drilling Procedures and Monitoring Well Construction Guidelines

Goals of the San Diego Guidelines

- Ensure the quality of the seal
- Ensure the quality of the data
- Ensure a long lifetime of the well

Installation Scenarios That Are Being Discussed

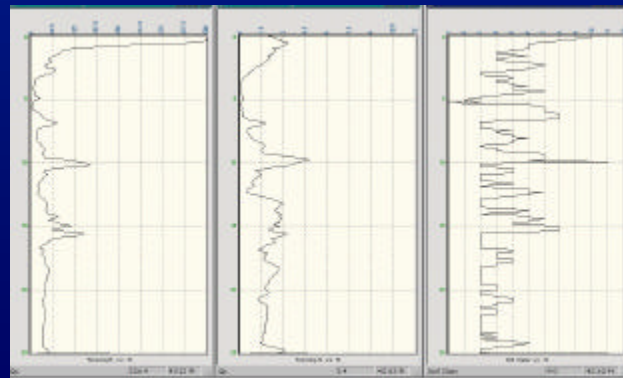
- Seal above water table
- Seal below water table
- Open hole construction



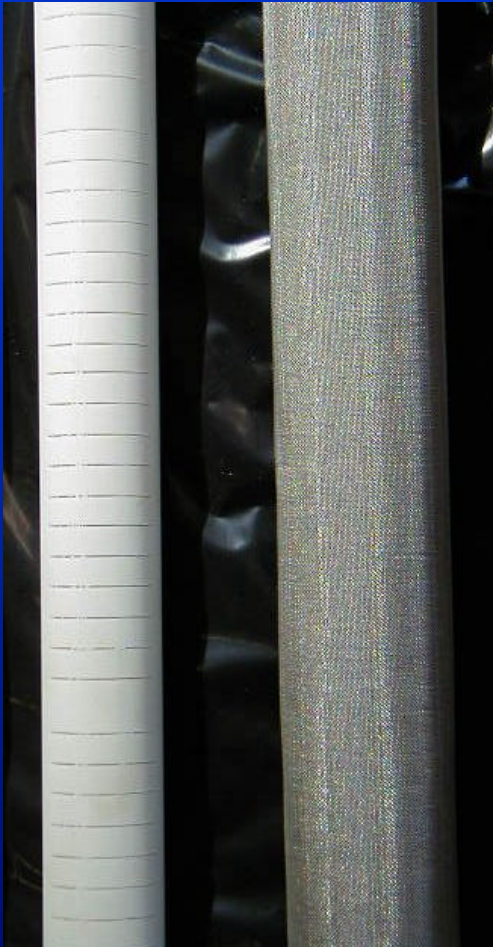
***The following information is preliminary
and subject to change.
These are NOT approved guidelines.***

Considerations For All Scenarios

- Know the subsurface geology and water table elevation beforehand.
- Depict this information on a well log.
- Direct push methods require different techniques for gathering this information than drilling methods.
 - Temporary piezometer
 - Soil sampling
 - Cone penetrometer data
 - Reasonable extrapolation of existing data



Seal Above Water Table



- Shall have a filter pack, either pre-packed or tremmied.
- Shall be designed to prevent transition seal materials from reaching screened interval.
- Shall have a transition seal of hydrated granular bentonite
- Shall have an annular seal
 - Grout
 - Hydrated granular bentonite



Prepacked Well Screens



Seal Extending Below Water Table

- Shall be constructed with a prepacked filter pack (?)
- May use (or may be required to use) a prepacked bentonite sleeve.



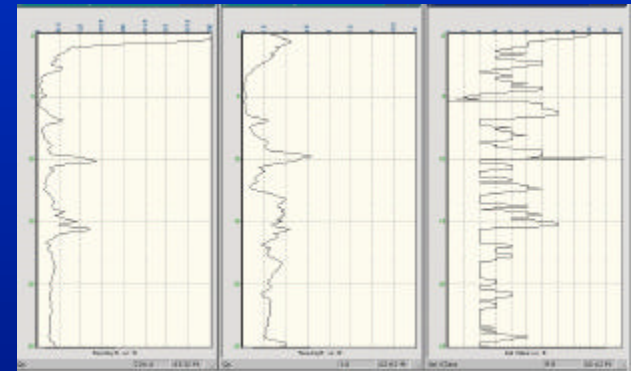
Open Hole Construction

- Open hole construction involves removing equipment from the hole prior to installing well materials.
- Must have favorable geologic conditions that prevent collapse of borehole walls
- Maximum total depth of 20 feet below grade.
- Must verify and document proper placement of annular materials.

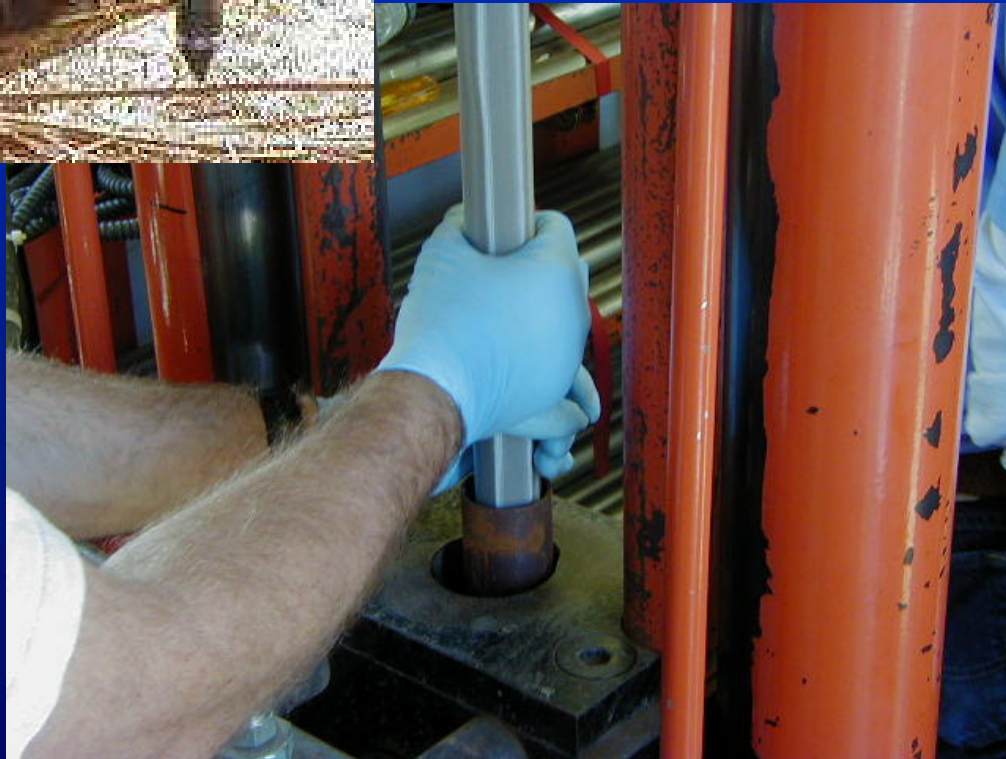
Recent Test Installation

Before setting well:

- Collected CPT data for stratigraphy
- Collected soil samples for contaminant data
- Set temporary piezometer



Assembling the Prepacked Screen



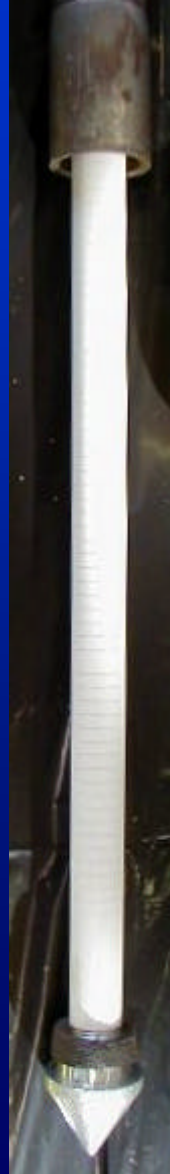
Installing Foam Bridge



Transition Seal and Grout Tube



Installing Riser Pipe and Removing Push Rods



Surface Completion



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